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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/598,729

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22442 7590 12/07/2010  
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EXAMINER

LAIOS, MARIA J

ART UNIT

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/598,729	<b>Applicant(s)</b> KIM ET AL.	
	<b>Examiner</b> MARIA J. LAIOS	<b>Art Unit</b> 1727	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 24 September 2010.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-25 is/are pending in the application.
- 4a) Of the above claim(s) 10-25 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-9 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)         | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)         | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____   | 6) <input type="checkbox"/> Other: _____                          |

### **DETAILED ACTION**

1. This office action is in response to the amendment filed 24 September 2010.

Claim 1 has been amended; Claims 10-26 stand withdrawn; claims 1-9 have been examined in this office action.

2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

#### ***Claim Rejections - 35 USC § 102***

3. The claim rejections under 35 USC 102(b) as being anticipated by Yoshimura et al. (EP 1 098 380 A1) for claims 1-4 and 8-9 are withdrawn because the independent claim has been amended.

#### ***Claim Rejections - 35 USC § 103***

4. The claim rejections under 35 USC 103(a) as being unpatentable over Yoshimura et al. and Wilkinson et al. for claims 5-6 are withdrawn. The claim rejection under 35 USC 103(a) as being unpatentable over Yoshimura et al. for claim 7 is withdrawn because the independent claim has been amended.

5. Claims 1-4 and 7-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yoshimura et al. (EP 1 098 380 A1) in view of Yoshimura et al. (US 6,291,094 B1 hereinafter '094).

As to claim 1, Yoshimura et al. discloses a separator (30) for a fuel cell (14) that is capable of closely contacting either an anode or a cathode of a membrane electrode assembly of a fuel cell (Figure 4) and interposing a fluid diffusion layer, the separator having a flow field channel (Figure 1) for allowing a fluid to flow between the separator and the fluid diffusion layer, characterized in that the separator (30) comprises a lamellar structure graphite foil (62 and 64 are metal layers 66 is graphite) and a hydrophobic layer is located on the interior side of the flow field channel (68 - col. 18 lines 5-10). Yoshimura et al. does not disclose the interior side of the flow field channel having a roughness of decades of micrometers. Yoshimura et al. '094 discloses a separator for a fuel cell comprising a layered system of metal and graphite layers. Yoshimura et al. '094 teaches the concept of roughening a surface in order increase the adhesion strength between the coating layers (col. 12 lines 58-64). Yoshimura et al. teaches the roughening can be as large as about 1 to several ten micrometers (decades of micrometers). Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to use the concept of Yoshimura '094 to roughen the portion of the fuel cell of Yoshimura that is coated because Yoshimura '094 teaches this will increase the adhesion of the coatings.

The product-by-process limitations of claim 1, formed by impregnation, is not given patentable weight since the courts have held that patentability is based on a product itself, even if the prior art product is made by a different process (In re Thorpe, 227 USPQ 964, 1985). Moreover, a product-by-process limitation is held to be obvious if the product is similar to a prior art product (In re Brown, 173 USPQ 685, and In re

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Fessman, 180 USPQ 324). Claim 1 as written does not distinguish the product of the instant application from the product of the prior art.

As to claims 2 and 3, Yoshimura et al. the lamellar structure graphite foil comprises a stainless steel layer (62 and 64-col. 8 lines 9) which are exteriorly exposed interposing the hydrophobic layer (Figure 1).

As to claim 4, Yoshimura et al. discloses the graphite is the graphite is free from resin (Paragraph 62 when the filler is made with thermally expanding graphite).

As to claim 7, Yoshimura et al. discloses the water repellent material is coated on the separator in order to give sufficient corrosion resistance and enhance the water drainage of the fuel cell (Paragraph 88) but fails to disclose the thickness of the hydrophobic later in the range of 30-100 micrometers as is claimed. It is concluded that the thickness of the hydrophobic layer is critical and should be treated as a result effective parameter in the separator are. Therefore it would have been with in the skill of the ordinary artisan to adjust the thickness of the hydrophobic layer within 30-100 micrometers because this would ensure the separator plate has sufficient corrosion resistance and ensure sufficient water drainage within the fuel cell.

As to claims 8 and 9, Yoshimura et al. discloses a manifold in the separator (Figure 8) and a sealing member is unified to the separator along each circumference of the manifold and an area for contacting the fluid diffusion layer of the electrode and the sealing member encloses the manifold layer and the area for contacting the fluid diffusion layer of the electrode (Paragraph 90-91).

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6. Claims 5-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yoshimura et al (EP 1 098 380 A1) in view of Yoshimura et al. (US 6,291,094) as applied to claims 1-4 and 7-9 above, and further in view of Wilkinson et al. (US 5,527,363).

As to claims 5 and 6, modified Yoshimura et al. discloses a separator for a fuel cell comprising a lamellar structure graphite foil and a hydrophobic layer as is disclosed above but does not disclose the bulk density of the graphite foil in the range of 1.5-2.0 g/cm<sup>3</sup> or the thickness of the graphite foil is in the range of 0.5-3mm. Wilkinson et al. discloses a flow field plate for a fuel cell (50) where in the plate is formed from conductive graphite foil sheet material (col. 10 lines 7-20) with a thickness of 0.064 inches (1.6256 mm). The plate is formed by alternating graphite foil and a metal sheet (Abstract). Wilkinson et al. teaches using a separator formed with graphite foil and metal plate minimizes the cell weight and column of the fuel cell (col. 13 lines 25-30). Although Wilkinson does not disclose the bulk density of the graphite foil explicitly it would have been obvious to one of ordinary skill to utilize a fuel cell made from graphite foil because this would decrease the weight of the fuel cell.

### ***Response to Arguments***

7. Applicant's arguments with respect to claim 1 have been considered but are moot in view of the new ground(s) of rejection as necessitated by amendment.

### ***Conclusion***

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8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MARIA J. LAIOS whose telephone number is (571)272-9808. The examiner can normally be reached on 11am-7pm Monday-Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dah-Wei Yuan can be reached on 571-272-1295. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/M. J. L./  
Examiner, Art Unit 1727

/Dah-Wei D. Yuan/  
Supervisory Patent Examiner, Art Unit 1727